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# EXPORT CONTROLS

## Sales of High Performance Computers to Russia's Nuclear Weapons Laboratories

Statement of Mr. Harold J. Johnson, Associate Director,  
International Relations and Trade Issues, National  
Security and International Affairs Division



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Personal Author: Johnson, H.

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Abstract: This testimony describes the events surrounding the sales of high performance computer's to Russia's nuclear weapons laboratories. Some of the issues discussed include; the Comprehensive Test Ban Treaty (CTBT) and its implications for exports to Russia, US export regulations as they apply to Russian nuclear laboratories, and the executive branch decision to return export applications without action.

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Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to discuss the sale of high performance computers to Russia's nuclear weapons laboratories. We understand that your hearing today will focus primarily on the alleged improper sales of computers to the Russian laboratories that have been the subject of recent media attention. As you know, those sales are currently being investigated by the Departments of Justice and Commerce, and by the U.S. Customs Service, and we understand that other witnesses here today will address that issue.

To help understand the implications of the alleged improper sales and the relevant policy issues, you asked us to define the context for those sales by discussing (1) the Comprehensive Test Ban Treaty (CTBT) and its implications for high performance computer exports to Russian laboratories, (2) U.S. export regulations as they apply to the Russian nuclear weapons laboratories, (3) the Russian request for such computers during the summer of 1996, and (4) the executive branch's decision to return without action several export license applications for high performance computers to the Russian laboratories and the implications of that decision. Although media reports have provided some details on the exporters and items involved in the prior license applications, we are limited by section 12(c) of the Export Administration Act of 1979 from discussing details of the license applications in public.

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## Summary

Mr. Chairman, before I begin discussing each of the areas you asked us to comment on, let me just briefly summarize what has occurred regarding the sale of high performance computers to Russia. Russia has expressed a strong desire to obtain high performance computers from the United States for use at its nuclear weapons laboratories. According to the Russian Minister of Atomic Energy, such computers are needed to help Russia maintain its nuclear stockpile, particularly in light of the CTBT prohibiting future nuclear explosions. Russia attempted to obtain high performance computers for its weapons laboratories for "civilian purposes" from two U.S. manufacturers. The manufacturers, in compliance with the export control laws and regulations, sought an export license for the transaction, but the applications were eventually returned by the Commerce Department without action. The U.S. government said it needed more information about how the computers would be used. Subsequently, press reports began to circulate in Russia and the United States that Russia had obtained U.S. high performance computers from

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other sources, and according to officials from Russia's Ministry of Atomic Energy, the computers would be used for nuclear stockpile maintenance. If these press reports are correct—and information supplied by the Russian Minister of Atomic Energy indicates the reports are correct—such a sale would appear to be contrary to the policy underlying U.S. export control regulations and to U.S. policy boundaries regarding cooperation with Russia's nuclear weapons program.

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## The Comprehensive Test Ban and High Performance Computers

With that overview, I would now like to discuss the relationship between the sale of high performance computers to Russia and U.S. policies regarding cooperation with Russia relative to CTBT. High performance computers are playing an increasingly important role in maintaining existing nuclear weapons stockpiles. As you know, the United States, Russia, and about 140 other countries have signed a CTBT that prohibits any nuclear explosions.<sup>1</sup> Since nuclear explosions are not permitted under a CTBT, the United States has embarked on a science-based stockpile stewardship program that uses past nuclear weapons test data, non-nuclear laboratory tests, and computer simulations to maintain confidence in the existing U.S. nuclear stockpile. Russian officials have indicated their desire to obtain high performance computers to help them maintain their nuclear weapons stockpiles.

The executive branch has determined that it is in the U.S. interest to cooperate with Russia on the safety and security of their nuclear weapons stockpiles, but within certain specific boundaries. Pursuant to this policy, discussions have been held with the Russian Ministry of Atomic Energy (MINATOM) and other officials on the possibility of undertaking cooperative projects under a CTBT. Department of Energy officials said that the policy boundaries for potential cooperative projects are that they would be unclassified, and most importantly, they would not enhance the performance of Russian nuclear weapons or contribute to Russian nuclear weapons design.<sup>2</sup> These officials stated that any access to computers provided to Russian scientists will be consistent with current export control laws. The regulations implementing the law provide the executive branch the authority to deny a license for any item intended for the research, development, design, manufacture, construction, testing,

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<sup>1</sup>The CTBT will enter into force when 44 nations, named in the treaty, deposit their instruments of ratification, but no earlier than September 24, 1998. Three of those 44 states—India, Pakistan, and North Korea—have not yet signed the treaty.

<sup>2</sup>Los Alamos National Laboratory defines performance as the ability of a nuclear weapon or weapon system to operate in a specified manner (e.g. yield, range, accuracy, radiation spectrum) under stated conditions and is essentially equivalent to reliability.

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operations, or maintenance of any nuclear explosive device or other sensitive nuclear activities. With this in mind, the concern is that if a high performance computer is sold to a Russian nuclear weapons laboratory, even for ostensibly civilian purposes, how would the United States devise a safeguard plan to detect the possible diversion of computers from civilian uses to proscribed nuclear weapons activities? Clearly, there is a greater opportunity to devise such a plan if an export license is sought.

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## Policies and Regulations Affecting the Export of High Performance Computers

Now let me turn more specifically to the policies and regulations affecting the export of high performance computers to Russian nuclear weapons laboratories. The United States has long maintained export controls over high performance computers for national security and nuclear non-proliferation reasons. On October 6, 1995, the executive branch announced a new policy for exporting high performance computers. This policy now focuses controls on computers that have a significant impact on U.S. and allied security interests and eliminated controls that were deemed unnecessary or ineffective due to rapid advances in computer technology. For example, the new policy removes licensing requirements for sales of common desk top computers to most countries. The policy requires companies to obtain an export license when selling U.S.- manufactured high performance computers to Russia and certain other countries when the computers (1) are intended for a military end user or an end user involved in proliferation activity and have a composite theoretical performance (CTP)<sup>3</sup> of over 2,000 million theoretical operations per second (MTOPS) or (2) are intended for a civilian end user and have a CTP of over 7,000 MTOPS. The policy also requires exporters to keep accurate records of each export of a computer over 2,000 MTOPS to any destination, whether a license is required or not.

The policy also outlines a number of steps that the U.S. government may require of the exporter or the end user to safeguard computer exports. Among other things, the exporter or end user may be required to limit access to the computer or inspect computer logs and output. In addition, the end user may also be required to agree to on-site inspections by U.S. government or exporting company officials, who would review programs and software used on the computer, or to remote electronic monitoring of the computer.

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<sup>3</sup>CTP is a measure used to estimate the maximum possible performance of a computer as measured in millions of theoretical operations per second.

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The policy was announced after the executive branch concluded that computers capable of a CTP of up to 7,000 MTOPS would become widely available in international markets within the next 2 years. The executive branch set a lower export control limit of 2,000 MTOPS for military end users and end users of proliferation concern because, while these computers may be less controllable, the United States does not want to support proliferation or certain military efforts in these countries.

The U.S. export control policy also requires that an export license be sought for items when an exporter knows<sup>4</sup> that an export or reexport will be used directly or indirectly for certain proscribed nuclear activities, including nuclear explosive activities, unsafeguarded nuclear activities, and certain fuel cycle activities, whether or not they are safeguarded. The Department of Commerce's Bureau of Export Administration can also inform an exporter or reexporter that an export license is required for specified items to specified end users when the Bureau has determined that there is an unacceptable risk of diversion to proscribed nuclear activities.

The executive branch has commissioned a new review of high performance computer export control policy which will be available at the end of 1997.

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## Russian Requests for High Performance Computer Exports

In the fall of 1995, two U.S. computer manufacturers applied for export licenses to sell U.S. high performance computers to the Russian nuclear weapons laboratories known as Arzamas-16 and Chelyabinsk-70. According to the Commerce Department's interpretation of section 12(c) of the Export Administration Act of 1979, I cannot provide any further details about these cases in public. However, according to press reports, the license applications were submitted by Convex Computer Corporation and IBM, and the end uses for the computers were for groundwater and atmospheric pollution monitoring.

In the early summer of 1996, the Russian Minister for Atomic Energy sent a letter to the Secretary of Energy expressing his concern about U.S. export restrictions on high performance computers. This letter also requested that Russian and U.S. officials begin discussing the possible export of a Convex SPP 2000 computer. This computer is more capable than any computer known to have been in use in Russia at that time. Although the Commerce Department had not received an export license application for

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<sup>4</sup>The definition of knowledge in 15 CFR Part 772 includes reason to know or reason to believe.

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the computer, the Secretary of Energy asked MINATOM for additional information on how Russia planned to use the SPP 2000 computer and the other computers for which the executive branch was then reviewing export license applications. The Minister for Atomic Energy indicated that the SPP 2000 would be used to help maintain Russia's nuclear stockpile, but that the other computers for which export licenses were pending would be used for civilian purposes at Russian nuclear weapons laboratories. According to the manufacturer, the SPP 2000, now known as the Exemplar X-Class, can be configured with a maximum of 64 processors and the manufacturer told us that the machine has a maximum performance rating of 22,275 MTOPS.

Our review of computer export data indicates that it was unlikely that Russian military and nuclear weapons laboratories had acquired computers capable of more than approximately 3,500 MTOPS, due to a lack of known sales of computers above that capability from the United States or Japan, the only countries currently producing computers above that level. However the capabilities of the Russian nuclear weapons laboratories, before the recently reported sales, may have been considerably less. The specific details are classified.

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## Executive Branch Decides Not to Act on the Export License Applications

Although the Russian Minister of Atomic Energy explained that MINATOM would use the computers sought under the pending applications for civilian end uses, the executive branch decided to return the license applications to the exporters without action. The Commerce Department told the exporters that the U.S. government was taking this action because of insufficient information about the end use of the computers. Commerce Department officials told us that a decision to return a license application without action means that the license application had neither been approved nor denied, but that if a license is required, such a decision blocks the export. The exporters can reapply for a license in the future.

In December 1996, the State Department informed MINATOM that the United States did not approve the export license applications under review because the applications were inconsistent with the U.S. government's export control policy. This policy seeks to prevent the export of high powered computers for end uses or end users that directly or indirectly support nuclear weapons activities.

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## Possible Improper Sale of High Performance Computers to Russia

Subsequent to the executive branch's decision to return the license applications without action, press reports began to circulate here and in Russia that Russia had obtained several high performance computers from U.S. companies, apparently without an export license.<sup>5</sup> Press reports indicated that MINATOM told one of the companies that sold them a computer without a license that the computer would be used for modeling of earth water pollution caused by radioactive substances. However, MINATOM officials have stated that the computers will be used to maintain the Russian nuclear weapons stockpiles and the Minister of Atomic Energy indicated that the computer would be used to confirm the reliability of Russia's nuclear arsenal and ensure its proper working order under the terms of the CTBT. Because the computers Russia obtained use a technology known as parallel processing, a number of processors can be added to increase their performance. If the high performance computers allegedly acquired by Chelyabinsk-70 were to be aggregated into a single cluster, the laboratory would have a central computer with a CTP capability of about 9,000 MTOPS. Through other acquisitions that the Russian Minister indicated had been made, this capacity could be increased to about 14,000 MTOPS.

This concludes my prepared remarks. My colleague and I would be pleased to respond to any questions you may have.

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<sup>5</sup>U.S. press reports indicate that Silicon Graphics, Inc., sold four computers to Chelyabinsk-70 in the fall of 1996 for \$650,000 and a distributor in Europe sold an IBM computer for \$7 million to MINATOM. *The New York Times* has reported that Russian nuclear officials said the computer will be used to simulate nuclear weapons tests.